邱依琇 助理教授

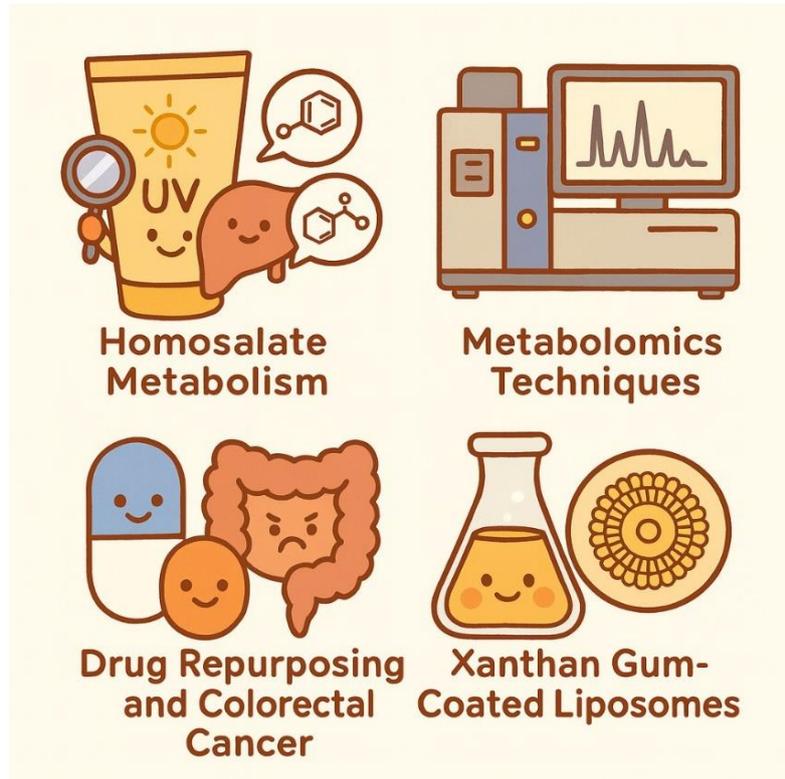## 藥學院/毒理學碩士學位學程

　　本研究團隊的成果聚焦於「環境暴露風險」、「高解析代謝體方法學」以及「臨床相關疾病治療策略」，展現跨毒理、分析化學到轉譯醫學的研究能量。在環境健康領域，我們以防曬乳中常用的紫外線吸收劑 Homosalate（HMS）作為研究標的，首次系統性鑑定九種 HMS 潛在代謝物，並發現兩種具結構特異性的全新代謝物，成果可提供未來人類暴露生物標記的重要依據，及釐清其對健康的影響。

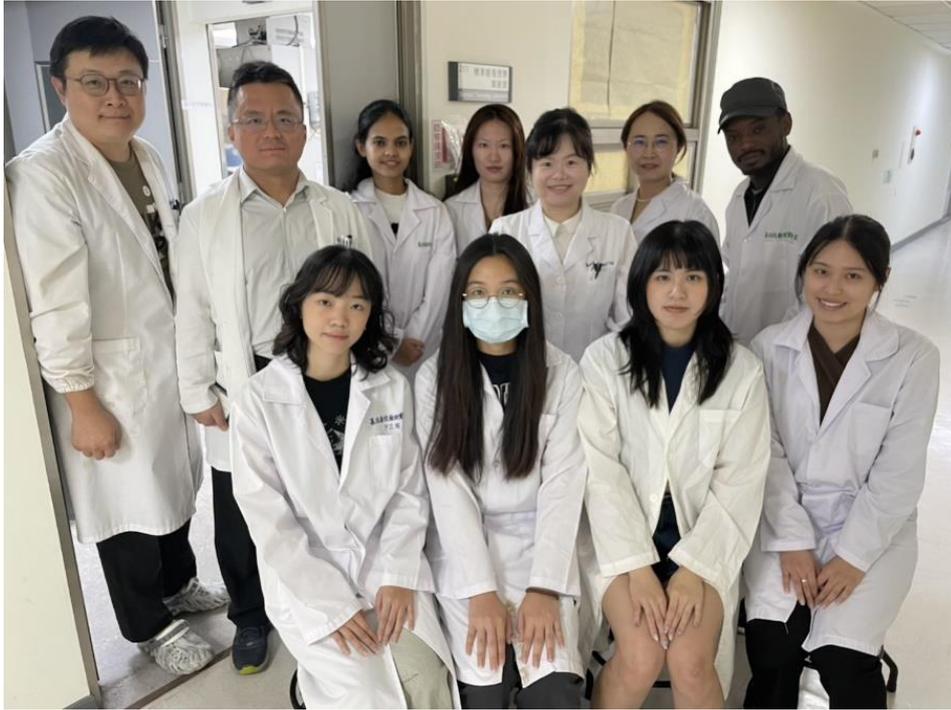　　(主要論文：Yi-Shiou Chiou *et al.,* Environmental Pollution, 386, 127161, 2025)

　　在方法學創新方面，我們以 nifedipine、rosiglitazone 與 pioglitazone 為模式藥物，提出高效代謝物鑑定策略，建立高再現性且更完整的鑑定流程，推進台灣在代謝體分析領域的技術深度。在疾病研究方面，我們透過 CMS4 分型及生物資料庫分析，發現 pitavastatin 與 atorvastatin 能在高血糖環境下降低轉移型大腸癌細胞的化療抗性，並與 5-FU 產生協同作用，提出具臨床潛力的「老藥新用」策略。此外，食品科技的研究亦指出以 Xanthan gum 包覆的維生素 C 脂質體可大幅提升穩定性與包覆率，有效拓展機能性成分在食品與保健領域的應用。

　　整體而言，我們研究團隊從化學物質風險解析、分析技術創新到臨床疾病干預皆有具體突破，不僅深化環境健康與代謝體學的科學基礎，也為未來精準醫學與預防保健發展提供實質貢獻。

Homosalate Metabolism

Metabolomics Techniques

Drug Repurposing and Colorectal Cancer

Xanthan Gum-Coated Liposomes

【具體成果】

● 獲獎

1. 114 年度國家科學及技術委員會補助大專校院研究獎勵

2. 2024 年研究績優教師-優秀論文獎

【研究團隊】

團隊成員： 邱依琇、石佳朧、丁保淼、曾敏峯、黃奇英

團隊簡介： 我們研究團隊專注於環境毒理、代謝體學與精準健康，從環境荷爾蒙代謝、生物標記探索，到藥物重定位與功能性載體開發均有成果。我們結合高解析質譜、多體學與細胞/動物/臨床模型，致力於揭開化學暴露對健康的影響，並發展具臨床與產業價值的創新策略。

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The research team's achievements focus on "environmental exposure risks", "high-resolution metabolomics methodology" and "clinical-related disease treatment strategies", demonstrating the research capabilities spanning toxicology, analytical chemistry, and translational medicine.

In the field of environmental health, we used Homosalate (HMS), a common UV absorber in sunscreen products, as the research subject. For the first time, we systematically identified nine potential metabolites of HMS and discovered two new metabolites with structural specificity. The results can provide important evidence for future human exposure biomarkers and clarify their impact on health. (Major publication：Yi-Shiou Chiou *et al.*, Environmental Pollution, 386, 127161, 2025)

In terms of methodological innovation, we used nifedipine, rosiglitazone and pioglitazone as model substances and proposed an efficient metabolite identification strategy, establishing a highly reproducible and more complete identification process, advancing Taiwan's technical depth in metabolomics analysis. In disease research, through CMS4 classification and biometric data analysis, we found that pitavastatin and atorvastatin can reduce the chemotherapy resistance of metastatic colorectal cancer cells in a hyperglycemic environment and produce a synergistic effect with 5-FU, proposing a clinically promising "old drug new use" strategy. Additionally, research in food technology indicates that vitamin C liposomes coated with xanthan gum can significantly improve stability and encapsulation rate, effectively expanding the application of functional components in food and health care.

Overall, our research team has made specific breakthroughs in chemical substance risk analysis, analytical innovation and clinical disease intervention. Not only has it deepened the scientific basis of environmental health and metabolomics, but it has also made substantive contributions to future precision medicine and prevention strategies.
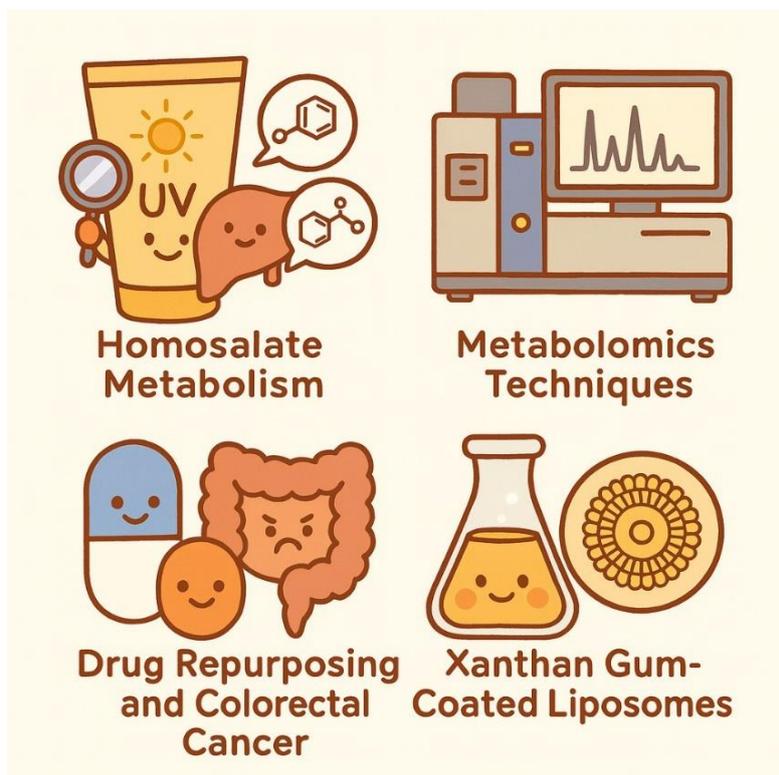
【Concrete Results】

● **Awards**

1. 2025 National Science and Technology Council (NSTC)-funded research awards for universities and colleges

2. 2024 KMU Outstanding Faculty Research Award (IF)

【Research Team】

Team Member: Yi-Shiou Chiou, Chia-Lung Shih, Baomiao Ding, Min-Feng Tseng, Chi-Ying F. Huang

Overview: Our research team focuses on environmental toxicology, metabolomics and precision health. We have achieved results in areas ranging from the metabolism of environmental hormones and biomarker exploration, to drug repurposing and the development of functional carriers. By integrating high-resolution mass spectrometry, multi-omics, and cell/animal/clinical models, we are dedicated to uncovering the effects of chemical exposure on health and developing innovative strategies with clinical and industrial value.

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